REMARKS

Claim 4 is pending in the application. Claim 4 presently stands rejected.

The amended title of the invention is objected to; specifically, the Examiner indicated that the new title "Stator of AC Generator for Use in a Vehicle" is not descriptive. Applicants further amend the title to overcome this objection.

Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Kurihashi et al. (JP 63-194543) in view of newly cited Schorm et al. (5,341,561).

Analysis

Claim 4 is directed to a stator which includes conductor wires of polymorphic cross-section accommodated within a slot portion. The polymorphic cross-sectional wires are provided in the slot portion so that the longitudinal axis of the cross-sections thereof extend predominately in the radial direction of the stator core.

Kurihashi fails to teach or suggest polymorphic cross-sectional conductor wires, or that the wires should have their longitudinal axis extending in the radial direction of the stator core. Moreover, Kurhashi fails to teach or suggest a ratio (space factor) of 75% for the cross-sectional area of the group of conductor wires to the cross-sectional area of the slot portion.

Specifically, Kurihashi discloses a stator for a vehicle generator having a stator winding 4 which is formed in a rectangular section at a slot insertion portion and in a circular section at the other parts as shown in Figs. 1 and 5. There is no teaching or suggestion for using polymorphic

cross-sectional wires. Further, Kurihashi teaches that the space factor is increased up to 80% by forming the slot insertion portion of the stator winding in the rectangular section, to thereby achieve high output. However, Kurihashi does not teach or suggest that the longitudinal axis of the cross-section of the slot insertion portion is directed in the radial direction of the stator core. Further, Kurihashi does not teach or suggest that the radial rigidity of the stator is strengthened over the entire circumference by directing the longitudinal direction of the cross-section of the wire accommodated within the slot in the radial direction, thereby suppressing the vibration amplitude due to the radial vibration mode to reduce the electromagnetic noise. Thus, there is no teaching or suggestion that the wires are polymorphic, that the longitudinal direction of the cross-section of the wire is in the radial direction, or the high ratio of the wire cross-section within the slot cross-section as in the present invention.

As discussed in the specification of the pending application, the polymorphic cross-sectional wires allows for the most efficient use of the tooth portions of the stator core. The polymorphic cross-section only requires one of the outer side surfaces of the wire to be rectilinear, thus, allowing for the wires to consist of varying shapes to fill in the slot portion most efficiently. Kurihashi fails to teach or suggest this feature, since the winding 4 is merely rectangular, and there is no teaching or suggestion that the cross-sections of the wire may vary; rather all the cross-sections appear to be the same.

The polymorphic cross sections of the present invention are important for realizing a high space factor, e.g., at least 75%, in the slot portions that are not necessarily rectangular. As shown in Fig. 11, for example, since the wires are polymorphic in cross-section, only one side of

a wire necessarily has a rectilinear side. This allows for the wires to ~~deform and~~ fit within the slot so as to utilize at least 75% of the slot space.

Schorm discloses a stator or rotor for an electric machine having a winding formed in a rectangular longitudinal direction thereof in the radial direction. However, Schorm does not teach or suggest that the space factor is increased up to or more than 75% to achieve high output. Further, Schorm does not teach or suggest that the longitudinal direction of the wire accommodated in the groove is directed in the radial direction to strengthen the radial rigidity of the stator. Still further, Schorm is not directed to polymorphic wires.

Consequently, there is no motivation to provide the stator of Kurihashi with the winding structure described in Schorm for the purpose of strengthening the radial rigidity of the stator to reduce the electromagnetic noise while maintaining a high output.

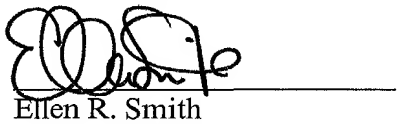
In view of the foregoing, claim 4 is not rendered unpatentable by the combination of cited references.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this case, and any required fee, except for the Issue Fee, for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE TITLE:

The title is changed as follows:

STATOR OF AC GENERATOR FOR USE IN A VEHICLE WITH RADIALLY ALIGNED, RECTILINEAR POLYMORPHIC CROSS-SECTION CONDUCTOR WIRES

IN THE CLAIMS:

Claim 4 is amended as follows:

4. (Twice Amended) A stator of an AC generator for use in a vehicle comprising:

a cylindrical stator core in which a plurality of tooth portions are provided at [equiangular] intervals along the inner circumference of a cylindrical core [back] portion and a plurality of slot portions are each formed between adjacent tooth portions; and

a stator coil incorporated in said stator core, said stator coil having a group of coils constituted by predetermined numbers of turns of conductor wires and including a plurality of rectilinear portions and coil end portions interconnecting the end portions of adjacent rectilinear portions, said rectilinear portions being sequentially accommodated in the slot portions [of] every predetermined number of slots and said coil end portions being protruded axially outwardly from [the] an end surface of said stator core;

wherein [a greater part of the group] each of [conductor wires constituting] said rectilinear [portion] portions, [which are] accommodated within said slot [portion] portions, [is formed into] has a polymorphic cross-section; and

wherein the ratio of the overall cross-sectional area of the group of [conductor wires constituting] said rectilinear [portion] portions accommodated within said slot portion, relative to the cross-sectional area of said slot portion, is not less than 75%,

wherein [the] a greater part of the group of [conductor wires of polymorphic cross-section which constitute said] rectilinear [portion] portions of polymorphic cross section which are accommodated within said slot portion [is] are directed such that [the] a longitudinal axis of the cross-section thereof extends in the radial direction of said stator core.